

PATENT  
Customer No. 22,852  
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**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re Application of: )  
Armando Annunziato et al. ) Group Art Unit: 2617  
Application No. 10/566,677 )  
Examiner: Vu, Michael T  
Filed: February 1, 2006 )  
For: A METHOD FOR PLANNING ) Confirmation No. 9211  
CELLULAR COMMUNICATION )  
NETWORKS, CORRESPONDING )  
NETWORK AND COMPUTER )  
PROGRAM PRODUCT THEREFOR )

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Commissioner for Patents  
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Alexandria, VA 22313-1450

Sir:

**APPEAL BRIEF UNDER BOARD RULE § 41.37**

In support of the Notice of Appeal filed March 24, 2011, and further to Board Rule 41.37, Appellants present this brief and enclose a fee payment of \$540.00 required under 37 C.F.R. § 41.20(b)(2). This Appeal responds to the final rejection of claims 22, 23, and 25-42 in the Final Office Action mailed October 29, 2010 and subsequent Advisory Action mailed February 24, 2011.

If any additional fees are required or if the enclosed payment is insufficient, Appellants request that the required fees be charged to Deposit Account No. 06-0916.

## TABLE OF CONTENTS

I.	<b>Real Party In Interest .....</b>	<b>3</b>
II.	<b>Related Appeals and Interferences.....</b>	<b>4</b>
III.	<b>Status Of Claims .....</b>	<b>5</b>
IV.	<b>Status Of Amendments.....</b>	<b>6</b>
V.	<b>Summary Of Claimed Subject Matter.....</b>	<b>7</b>
	A. <b>Independent Claim 22.....</b>	<b>7</b>
VI.	<b>Grounds of Rejection to be Reviewed.....</b>	<b>8</b>
VII.	<b>Argument.....</b>	<b>9</b>
	A. <b>Legal Standard.....</b>	<b>9</b>
	B. <b>Claims 22, 23, and 25-42.....</b>	<b>10</b>
	1. <b>The rejection of independent claim 22 under 35 U.S.C.                 § 103(a) should be reversed.....</b>	<b>10</b>
	2. <b>The rejection of claims 23 and 25-42 under 35 U.S.C.                 § 103(a) should be reversed.....</b>	<b>13</b>
VIII.	<b>Conclusion .....</b>	<b>18</b>
IX.	<b>Claims Appendix.....</b>	<b>19</b>
X.	<b>Evidence Appendix .....</b>	<b>24</b>
XI.	<b>Related Proceedings Appendix .....</b>	<b>25</b>

I. **REAL PARTY IN INTEREST**

Telecom Italia S.p.A. is the real party in interest, the assignee of the entire right, title, and interest in the application, as indicated by an Assignment recorded on February 1, 2006.

**II. RELATED APPEALS AND INTERFERENCES**

There are currently no other appeals or interferences, of which Appellants, Appellants' legal representative, or Assignee are aware, that will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

**III. STATUS OF CLAIMS**

Claims 22, 23, and 25-42 are pending in the application and stand rejected. Claims 1-21 and 24 have been cancelled without prejudice or disclaimer of their subject matter.

Appellants appeal the rejection of claims 22, 23, and 25-42.

Pursuant to 37 C.F.R. § 41.37(c)(1)(iii) and (viii), Section IX, entitled “Claims Appendix,” contains a clean copy of the claims involved in this appeal.

**IV. STATUS OF AMENDMENTS**

Appellants filed an Amendment on September 14, 2010, in reply to an Office Action mailed June 16, 2010, and to cancel claim 24 and amend claims 22, 23, 28, 32, 41, and 42.

In reply to a Final Office Action mailed October 29, 2010, Appellants filed a Request for Reconsideration after Final on January 28, 2011, without further claim amendments.

**V. SUMMARY OF CLAIMED SUBJECT MATTER**

**A. Independent Claim 22**

Independent claim 22 recites a method of planning cellular communication networks, implemented using a computer. (*See, e.g.*, page 3, lines 16-28.<sup>1</sup>) The method includes a step of defining a joint cost function to be optimized (*see, e.g.*, page 5, lines 1-4, page 8, lines 4-13, and page 11, lines 1-16), the joint cost function being indicative of a quality of service of location-based services (*see, e.g.*, page 3, lines 3-11, page 4, lines 1-5, and page 6, line 30 to page 7, line 5) and at least one additional class of services rendered by the network (*see, e.g.*, page 4, lines 16-25), the at least one additional class of services being selected from a group of voice services and data services (*see, e.g.*, page 10, lines 2-9). The method further includes a step of optimizing, by the computer, the joint cost function. (*See, e.g.*, page 11, lines 1-16.)

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<sup>1</sup> Citations are to the page and line numbers of the as-filed International Application specification.

**VI. GROUNDS OF REJECTION TO BE REVIEWED**

Claims 22, 23, and 25-42 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,336,035 (“*Somaza*”) in view of U.S. Patent No. 5,987,328 (“*Ephremides*”).

## VII. ARGUMENT

Each claim of this patent application is separately patentable and, upon issuance of a patent, will be entitled to a separate presumption of validity under 35 U.S.C. § 282.

Accordingly, each of claims 22, 23, and 25-42 should be considered individually in view of the arguments against the Examiner's rejections.

In the Final Office Action mailed October 29, 2010, the Examiner attempted to establish a *prima facie* case of obviousness by asserting a combination of references to allegedly teach and/or suggest the recitations of Appellants' claims. However, as explained below, the Examiner has not established a *prima facie* case of obviousness.

### A. Legal Standard

The key to supporting any rejection under 35 U.S.C. § 103 is the clear articulation of the reason(s) why the claimed invention would have been obvious. Such an analysis should be made explicit and cannot be premised upon mere conclusory statements. MPEP § 2142. “A conclusion of obviousness requires that the references(s) relied upon be enabling in that it put the public in possession of the claimed invention.” MPEP § 2145. Furthermore, “[t]he mere fact that references can be combined or modified does not render the resultant combination obvious unless the results would have been predictable to one of ordinary skill in the art” at the time the invention was made. MPEP § 2143.01(III), internal citation omitted. Moreover, “[i]n determining the differences between the prior art and the claims, the question under 35 U.S.C. § 103 is not whether the differences themselves would have been obvious, but whether the claimed invention as a whole would have been obvious.” MPEP § 2141.02(I), internal citations omitted (emphasis in original).

“[T]he framework for the objective analysis for determining obviousness under 35 U.S.C. § 103 is stated in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966).... The factual inquiries . . . [include determining the scope and content of the prior art and] . . . [a]scertaining the differences between the claimed invention and the prior art.” MPEP § 2141(II). “Office personnel must explain why the difference(s) between the prior art and the claimed invention would have been obvious to one of ordinary skill in the art.” MPEP § 2141(III).

In this application, a *prima facie* case of obviousness has not been established because the Examiner has neither properly determined the scope and content of the prior art, nor properly ascertained the differences between the claimed invention and the prior art. Accordingly, the Examiner has failed to clearly articulate a reason why the prior art would have rendered the claimed invention obvious to one of ordinary skill in the art.

**B. Claims 22, 23, and 25-42**

**1. The rejection of independent claim 22 under 35 U.S.C. § 103(a) should be reversed.**

*Somaza* and *Ephremides*, whether taken separately or in combination, do not disclose or suggest at least Appellants’ claimed “step of defining a joint cost function to be optimized, the joint cost function being indicative of a quality of service of location-based services and at least one additional class of services rendered by the network, the at least one additional class of services being selected from a group of voice services and data services,” as recited in claim 22 (emphases added).

The Examiner alleged that *Somaza* teaches the elements of claim 22 at col. 1, lines 52-65, Figs. 3A-3C, col. 7, lines 3-43, and col. 5, line 63 to col. 6, line 27 of *Somaza*. See Final Office Action, page 3. Appellants respectfully disagree.

In particular, the Examiner alleged that *Somaza*'s disclosure of "adding equipment and other resources to their [service providers'] system to accommodate more users and provide better service coverage for subscribers" (*Somaza*, col. 1, lines 56-58) constitutes the claimed "defining a joint cost function to be optimized." *See* Final Office Action, page 3. Further, the Final Office Action alleged that *Somaza*'s Fig. 3C shows a cost comparison chart discloses the claimed "quality of service of location-based services." *See id.* These allegations are incorrect.

*Somaza*'s system does not include any "joint cost function," as recited in claim 22. In *Somaza*, adding equipment and other resources to an existing system to accommodate more users does not constitute the claimed "defining joint cost function to be optimized," at least because the "adding" process disclosed by *Somaza* does not involve any steps of defining a function to be optimized. In addition, the network costs shown in Fig. 3C of *Somaza* refer to price or money to be paid (*see, e.g.*, *Somaza*, Fig. 3C, vertical axis of the COST COMPARISON chart showing "COST \$US"). Such costs do not indicate "quality of service" recited in claim 22, and therefore cannot constitute the claimed "joint cost function."

In contrast, Appellants' claimed "joint cost function" is clearly defined in the originally-filed specification at page 8, equation 1, as "characterised by merit functions for voice, data and location services" and in that it "point[s] out a merit value (e.g. QoS) as some combination of other related parameters." Specification, page 8, lines 4-13 (emphases added). In other words, Appellants' claimed "joint cost function" is a "function" related to a merit value which is determined by input parameters. The claimed "joint cost function" therefore has nothing to do with the "costs" disclosed in *Somaza*.

Moreover, *Somaza* does not disclose "quality of service of location-based services," as recited in claim 22 (emphasis added). The "quality of service" disclosed in col. 7, line 23 of

*Somaza* does not specify that such “quality of service” refers to “quality of service of location-based services.” In fact, *Somaza* merely discloses that quality of service may be one of the factors a user may consider when planning a wireless network (*see Somaza*, col. 7, lines 19-24), but does not disclose in particular the types of quality of service, such as quality of service of “location-based services,” “voice services,” and “data services,” as recited in claim 22. As such, *Somaza* fails to disclose Appellants’ claimed “joint cost function … indicative of a quality of service of location-based services and at least one additional class of services rendered by the network, the at least one additional class of services being selected from a group of voice services and data services,” as recited in claim 22 (emphases added).

In the Advisory Action, the Examiner alleged that *Somaza* “discloses [that] the information can [be] retrieved from one or more server locations on the World Wide Web, which is called Location Based Services (LBS) that associated with the quality of service, [*Somaza*] Col. 6, lines 1-22.” This allegation is incorrect.

The cited portions of *Somaza* have nothing to do with the claimed “quality of service of location-based services.” In contrast, *Somaza* discloses that

software tool 300 automatically generates parts lists, comparison charts, and cost models for equipment selected for a given network plan. Preferably, the product information includes current (i.e., continuously updated) vendor equipment information and inventory, cost models and financial data for each piece of vendor equipment, and equipment purchaser information. This product information can be retrieved from one or more server locations on the World Wide Web [(“WWW”)] or from other available sources (e.g., CD-ROM).

*Somaza*, col. 6, lines 4-13 (emphases added.) Therefore, *Somaza* discloses that “vendor equipment information and inventory, cost models and financial data for each piece of vendor equipment, and equipment purchases information” can be retrieved from WWW. The mere

disclosure of equipment related information retrieved from WWW has nothing to do with “quality of service of location-based services,” as recited in claim 22.

The Final Office Action applies *Ephremides* against the last element of claim 22, after admitting that “Somaza does not explicitly show optimizing, by the computer, the joint cost function.” Final Office Action, page 3. *Ephremides*, however, does not cure the deficiencies of *Somaza* discussed in the previous paragraphs. For example, *Ephremides* discloses a “method for placement of transmitters in an indoor or outdoor wireless network to optimize coverage.<sup>1</sup>” *Ephremides*, col. 1, lines 6-8 (emphasis added). Therefore, even though *Ephremides* may disclose some optimization, such optimization is for optimizing “coverage” instead of “joint cost function” recited in claim 22. In addition, *Ephremides* also fails to teach or suggest at least Appellants’ claimed “step of defining a joint cost function to be optimized, the joint cost function being indicative of a quality of service of location-based services and at least one additional class of services rendered by the network, the at least one additional class of services being selected from a group of voice services and data services,” as recited in claim 22 (emphases added).

Thus, *Somaza* and *Ephremides*, taken either alone or in combination, do not teach or suggest the above-quoted features of independent claim 22. The Examiner has therefore neither properly determined the scope and content of the prior art, nor properly ascertained the differences between the claimed invention and the prior art. Therefore, *Somaza* and *Ephremides* do not render Appellants’ independent claim 22 obvious under 35 U.S.C. § 103(a), and claim 22 should be allowable and the rejection reversed.

**2. The rejection of claims 23 and 25-42 under 35 U.S.C. § 103(a) should be reversed.**

The rejection of dependent claims 23 and 25-42 is legally deficient for at least the same reasons set forth above in connection with independent claim 22. Moreover, as explained below,

*Somaza* and *Ephremides*, taken either alone or in combination, fail to teach or suggest the additional recitations of these claims.

Claim 23

The Examiner alleged that col. 9, lines 7-9 of *Somaza* discloses the claimed “dilution of precision.” *See* Final Office Action, pages 3-4. This is incorrect. The dilution of precision (DOP), as known in the art, is a “measure of the strength or confidence factor in the accuracy of the position solution of objects, that measure having lower values when the confidence factor is greater.” Specification, page 4, lines 26-29. The cited portion of *Somaza* discloses that “[t]he proposed drive test route should cover a broad area to effectively measure signal strength with the cell.” Neither the coverage area nor the signal strength discloses the DOP, because neither is a “measure of the strength or confidence factor in the accuracy of the position solution of objects.” Therefore, claim 23 is not rendered obvious and the rejection should be reversed.

Claim 25

The Examiner alleged that *Somaza* discloses “providing a system for measuring at least one actual network parameter” in Figs. 3a-3c and discloses “comparing the measurements provided by said measurement system with the corresponding parameters as planned” at col. 6, lines 5-13. *See* Final Office Action, page 4. This is incorrect. Fig. 3a of *Somaza* “is an image generated by a software tool . . . that graphically represents products for wireless network planning” and Figs. 3b and 3c are images generated by the software tool of Fig. 3a. *Somaza*, col. 3, lines 36-42 (emphasis added). Therefore, none of these figures discloses the claimed “system for measuring at least one actual network parameter,” as recited in claim 25 (emphases added). In addition, as discussed above with respect to claim 22, col. 6, lines 5-13 of *Somaza* discloses that software tool 300 generates equipment related information, which has nothing to do with

“comparing the measurements provided by said measurement system with the corresponding parameters as planned,” as recited in claim 25. Therefore, claim 25 is not rendered obvious and the rejection should be reversed.

Claim 26

The Examiner alleged that *Somaza* discloses “locating at least one critical point in the network where inadequate quality of service is being provided” in Fig. 3c and col. 7, lines 19-43. *See* Final Office Action, page 4. This is incorrect. Fig. 3c of *Somaza* “represent[s] product comparisons associated with wireless network planning.” *Somaza*, col. 7, lines 20-21. That is, Fig. 3c is essentially a cost prediction tool interface. Although *Somaza* mentions that quality of service may be considered by a user when planning a network, *Somaza* discloses nothing about a “critical point in the network where inadequate quality of service is being provided,” as recited in claim 26. Therefore, claim 26 is not rendered obvious and the rejection should be reversed.

Claim 27

The Examiner alleged that *Somaza* discloses “generating information items indicative of counter measures to be carried out in said network in order to dispense with at least one critical point” at col. 7, lines 19-43, col. 2, lines 32-43, and col. 9, lines 39-45. *See* Final Office Action, page 4. This is incorrect. In particular, none of the cited portions disclose the claimed “counter measures.” Therefore, claim 27 is not rendered obvious and the rejection should be reversed.

Claim 30

The Examiner asserted that Fig. 6 and col. 9, lines 7-9 of *Somaza* “shows planned area or measure signal strength/dilution within the cell” and alleged that the cited portions disclose the features of claim 30. This allegation is incorrect. As discussed above, *Somaza* discloses that a “drive test route should cover a broad area to effectively measure signal strength within the cell.”

*Somaza*, col. 9, lines 8-9. However, neither the drive test route nor the signal strength discloses the claimed “dilution of precision.” Further, the disclosure of *Somaza* fails to mention anything about the “point-by-point value of the dilution of precision for all the pixels in the area subject to planning,” as recited in claim 30. Therefore, claim 30 is not rendered obvious and the rejection should be reversed.

Claim 31

The Examiner alleged that *Ephremides*’ cost function calculation and evaluation discussed at col. 5, lines 39-48, Fig. 1, and col. 7, line 56 to col. 8, line 21 disclose the features of claim 31. *See* Final Office Action, page 7. This is incorrect. *Ephremides*’ cost function has the form of either equation (1) or (2). *See Ephremides*, col. 5, lines 46-67. Neither of them “pertain[s] to location services only.” And neither of them is “a linear combination of said dilution of precision and the average and minimum values thereof.” For example, equation (1) involves size of the uncovered area ( $U$ ), size of the interference ( $I$ ), and a scaling constant ( $\alpha$ ) having a value between 0 and 1. *See id.* Equation (2) includes probability ( $P$ ) associated with areas  $I_i$  to account for dynamic nature of the system. None of these parameters constitute the recitations of claim 31. Therefore, claim 31 is not rendered obvious and the rejection should be reversed.

Claim 32

The Examiner alleged that Fig. 1 and col. 7, line 56 to col. 8, line 21 of *Ephremides* discloses the features of claim 32. This is incorrect. As discussed above, *Ephremides*’ cost function does not involve parameters pertaining to location services. In addition, *Ephremides*’ cost function does not account jointly for voice, data, and location services. Therefore, claim 32 is not rendered obvious and the rejection should be reversed.

Claim 35

The Examiner alleged that *Somaza* discloses the features of claim 35 in Fig. 10, col. 8, lines 37-57, Fig. 3c, and col. 7, lines 19-57. *See* Final Office Action, pages 9-10. This is incorrect. While *Somaza* may disclose that a technician can measure signal strength while driving through the cell (*see Somaza*, col. 8, lines 39-44), *Somaza* fails to disclose “locating at least one critical area wherein the quality of service of said location services fails to reach an expected quality of service level,” as recited in claim 35 (emphasis added). Therefore, claim 35 is not rendered obvious and the rejection should be reversed.

Claim 36

The Examiner alleged that *Somaza* discloses the features of claim 36 at col. 8, lines 37-57, Fig. 3c, and col. 7, lines 19-57. This is incorrect. While *Somaza* may disclose that a user is typically concerned about cost, quality of service, installation time, and other criteria when planning a network (*see Somaza*, col. 7, lines 21-23), *Somaza* does not disclose “selecting at least one location system as the one most affected by the variations in the network parameters being analyzed,” as recited in claim 36 (emphasis added). Therefore, claim 36 is not rendered obvious and the rejection should be reversed.

Claim 37

The Examiner alleged that *Somaza* discloses the features of claim 37 at Fig. 3c, col. 7, lines 19-57, and col. 9, lines 28-38. This is incorrect. *Somaza* discloses that actual RF propagation, along with topographical data, street map data, architectural clutter data, and GPS mapping data may be represented on a display. *Somaza*, col. 9, lines 30-37. However, *Somaza* does not disclose “a list of points in the network characterized by their quality of service,” as

recited in claim 37 (emphasis added). Therefore, claim 37 is not rendered obvious and the rejection should be reversed.

Claims 28, 29, 33, 34, 38-42

Claims 28, 29, 33, 34, 38-42 depend from claim 22. As already explained, *Somaza* and *Ephremides* do not support the rejection of claim 22. Accordingly, for the same reasons set forth above in connection with claim 22, the rejection of dependent claims 28, 29, 33, 34, 38-42 is also not supported by the cited reference and should be reversed.

**VIII. CONCLUSION**

Appellants respectfully request reversal of the Examiner's rejections, and allowance of claims 22, 23, and 25-42.

To the extent any extension of time under 37 C.F.R. § 1.136 is required to obtain entry of this Appeal Brief, such extension is hereby respectfully requested. If there are any fees due under 37 C.F.R. §§ 1.16 or 1.17 which are not enclosed herewith, including any fees required for an extension of time under 37 C.F.R. § 1.136, please charge such fees to our Deposit Account No. 06-0916.

Respectfully submitted,

FINNEGAN, HENDERSON, FARABOW,  
GARRETT & DUNNER, L.L.P.

Dated: May 20, 2011

/David M. Longo/  
By: \_\_\_\_\_  
David M. Longo  
Reg. No. 53,235

**IX. CLAIMS APPENDIX**

1.-21. (Cancelled)

22. (Previously Presented) A method of planning cellular communication networks, implemented using a computer, comprising the steps of:

defining a joint cost function to be optimized, the joint cost function being indicative of a quality of service of location-based services and at least one additional class of services rendered by the network, the at least one additional class of services being selected from a group of voice services and data services; and  
optimizing, by the computer, the joint cost function.

23. (Previously Presented) The method of claim 22, wherein said joint cost function is based on measuring a dilution of precision of said network.

24. (Cancelled)

25. (Previously Presented) The method of claim 22, comprising the steps of:  
providing a system for measuring at least one actual network parameter; and  
comparing the measurements provided by said measurement system with the corresponding parameters as planned.

26. (Previously Presented) The method of claim 22, comprising the step of locating at least one critical point in the network where inadequate quality of service is being provided.

27. (Previously Presented) The method of claim 26, comprising the step of generating information items indicative of counter measures to be carried out in said network in order to dispense with at least one critical point.

28. (Previously Presented) The method of claim 22, wherein said joint cost function is optimized by using as input data the location of at least one radiating system associated with one base station in said cellular communication network.

29. (Previously Presented) The method of claim 28, for planning a cellular communication network over a given area, comprising the steps of:

subdividing said area into sub-areas, one of said sub-areas corresponding to the destination sub-area of a new base station in said network, the remaining sub-areas being expected to be affected by the introduction of said new base station;

planning said destination sub-area of the new base station also by evaluating the effects on said remaining sub-areas; and

evaluating the quality of service resulting from said planning while ascertaining whether such a level of quality of service is satisfactory.

30. (Previously Presented) The method of claim 29, wherein said planning involves computing a point-by-point value of the dilution of precision for all the pixels in the area subject to planning.

31. (Previously Presented) The method of claim 30, wherein said planning involves computing a cost function pertaining to location services only, said cost function being a linear combination of said dilution of precision and the average and minimum values thereof.

32. (Previously Presented) The method of claim 29, comprising the step of optimizing a cost function for voice, data and location services.

33. (Previously Presented) The method of claim 29, wherein, if said quality of service is found not to be satisfactory, comprising the step of re-planning the position of at least one radiating system associated with one base station in said cellular network.

34. (Previously Presented) The method of claim 33, wherein said at least one radiating system whose position is re-planned associated with one base station is a radiating system associated with said new base station.

35. (Previously Presented) The method of claim 25, comprising the steps of:  
providing a set of network design parameters;  
obtaining from said measurement system a set of measurements corresponding to said set of design parameters; and  
locating at least one critical area wherein the quality of service of said location services fails to reach an expected quality of service level as a result of said set of measurements failing to comply with said set of network design parameters.

36. (Previously Presented) The method of claim 35, comprising the steps of:  
selecting a service scenario; and  
selecting at least one location system as the one most affected by the variations in  
the network parameters being analyzed.

37. (Previously Presented) The method of claim 35, comprising the step of providing  
a list of points in the network characterized by their quality of service.

38. (Previously Presented) The method of claim 35, comprising the steps of  
generating and displaying a map of critical points in the area under analysis.

39. (Previously Presented) The method of claim 22, comprising the step of providing  
a remote deployment module arranged for operating on a sub-set of the network subject to  
planning.

40. (Previously Presented) The method of claim 39, comprising the steps of  
configuring said remote deployment module for collecting local network data, pre-validating  
such measurements and either comparing said measurements with corresponding planning data  
of a network design sub-set or sending such measurements to a remote module for further  
processing.

41. (Previously Presented) A cellular communication network comprising at least  
one processing module for implementing the planning method of claim 22.

42. (Previously Presented) A nontransitory computer readable medium encoded with a computer program product loadable into a memory of a computer and including software code portions for performing the steps of the method of claim 22.

**X. EVIDENCE APPENDIX**

None.

**XI. RELATED PROCEEDINGS APPENDIX**

None.